Small Business Innovation Research/Small Business Tech Transfer

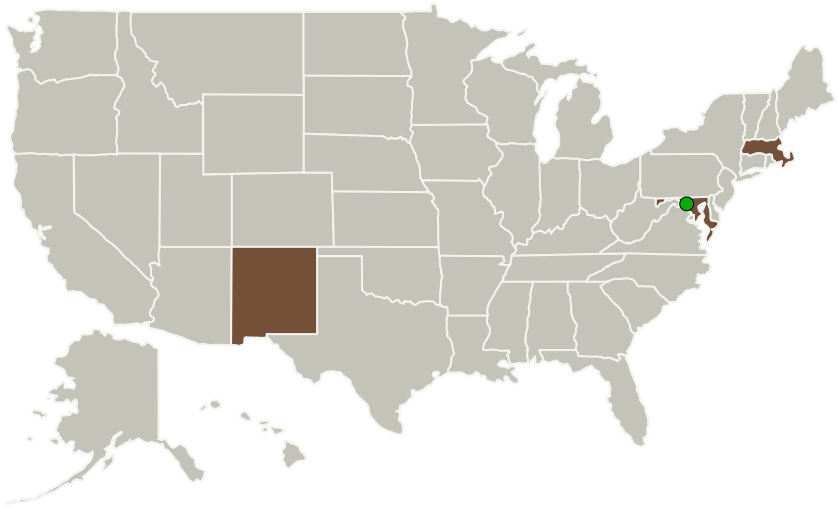
The Small Mixed Field Autonomous Radiation Tracker (SMART) Dosimeter, Phase I

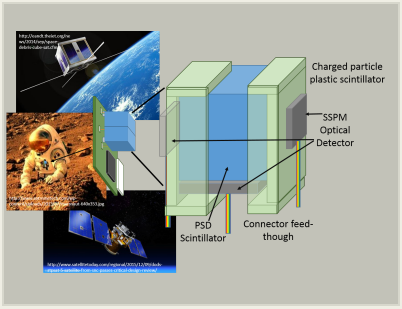
Completed Technology Project (2016 - 2017)

Project Introduction

Active dosimeters for astronauts and space weather monitors are critical tools for mitigating radiation induced health issues or system failure on capital equipment. Commercial spaceflight, deep space flight, and satellites require smarter, smaller, and lower power dosimeters. There are a number of instruments with flight heritage, yet as identified in NASA's roadmaps, this technology does not lend itself to a viable solution for active dosimetry for an astronaut, particularly for deep space missions. The proposed solution is an instrument that will provide dose distinguished by the type of particle, where tissue or physical damage is dependent on the energy and mass of the radiation. This is accomplished by advancing technologies developed by RMD and COSMIAC that will provide a comprehensive assessment of the radiation environment, as the instrument determines the dose for different particle species. Using RMD's advanced scintillation materials, low-power digitizers, and COSMIAC's digital signal processing, a compact dosimeter will be developed for intravehicular and extravehicular activates, as well as a space weather monitor for satellites.

Primary U.S. Work Locations and Key Partners





The Small Mixed Field Autonomous Radiation Tracker (SMART) Dosimeter, Phase I

Table of Contents

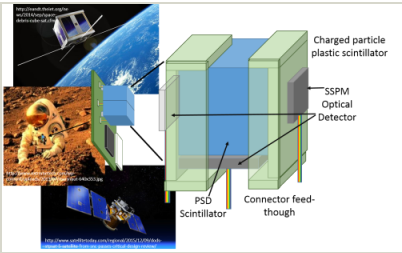
The Small Mixed Field Autonomous Radiation Tracker (SMART) Dosimeter, Phase I

Completed Technology Project (2016 - 2017)

Organizations Performing Work	Role	Type	Location
Radiation Monitoring Devices, Inc.	Lead Organization	Industry	Watertown, Massachusetts
COSMIAC at The University of New Mexico(COSMIAC)	Supporting Organization	Academia	Alburguerque, New Mexico
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts
New Mexico	

Images



Briefing Chart Image
The Small Mixed Field Autonomous Radiation Tracker (SMART) Dosimeter, Phase I
(https://techport.nasa.gov/image/132095)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Radiation Monitoring Devices, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

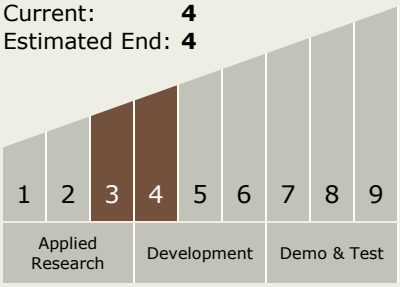
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Erik B Johnson

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



The Small Mixed Field Autonomous Radiation Tracker (SMART) Dosimeter, Phase I

Completed Technology Project (2016 - 2017)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.5 Monitoring Technology

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System